

REMARKS

By the above amendment, features of dependent claim 5 have been incorporated into independent claim 1, and similarly features of dependent claim 11 have been incorporated into independent claim 9, with claims 5 and 11 being cancelled. Additionally, claims 3 and 6 have been amended in a manner which should overcome the objection thereto, and claims 14 - 17 have been amended to depend from claim 13, as suggested by the Examiner such that the rejection of claims 14 - 17 under 35 USC 112, second paragraph, should be overcome. Additionally, other informalities in the claims have been corrected and new claims 18 - 25 have been added, wherein claims 18 - 20 depend directly or indirectly from claim 1 and recite further features of the present invention, new claim 21 depends from claim 9 and recites features corresponding to claim 2, and claim 22 is a new independent claim reciting other features of the present invention with claims 23 - 25 depending therefrom.

At the outset, applicants note that the present invention is directed to a fluid actuator which, as illustrated in Fig. 1, of the drawings of this application, includes an inner tube 1 that expands and contracts as fluid is fed and discharged, and a mesh sleeve 3 which covers the outer periphery of the inner tube 1. In accordance with the present invention, the mesh sleeve 3 covers the outer periphery of the inner tube and has a diameter which expands and a length which contracts as the inner tube expands, as apparent from Figs. 1 and 2 of the drawings of this application. Additionally, as illustrated in Fig. 3 and as described in the last paragraph at page 12 of the specification, the mesh sleeve has a fine mesh structure which prevents the inner tube 1 from partly swelling through the mesh of the mesh sleeve 3 when the inner tube expands, noting that Fig. 3 illustrates the mesh structure being formed of

three filaments, and page 13 describing the mesh sleeve being formed of 288 polyethylene filaments, as now recited in the newly added claims of this application. Additionally, in accordance with the present invention, as illustrated in Fig. 1 of the drawings of this application and described at pages 11 and 12 of the specification, a low friction member 5 obtained by knitting fine fibers so as to have expanding and contracting properties is disposed between the inner tube and the mesh sleeve with the low friction member being arranged so as to cover the inner tube. As described at page 11, the low friction member 5 is produced as a cylindrical body by knitting fine fibers in a circumferential direction without a seam utilizing the known technology for knitting stockings, and the low friction member which may be formed by a combination of a polyurethane core fiber and a nylon fiber exhibits a coefficient of friction to the mesh sleeve smaller than a coefficient of friction to the inner tube. As described in the first full paragraph at page 12 of the specification, owing to the provision of the low friction member 5 between the inner tube 1 and the mesh sleeve 3, there occurs no direct friction between the inner tube 1 and the mesh sleeve 3 despite expansion and contraction, and prevents the inner tube 1 from rupturing after a small number of repetitive operations, and prevents the fiber of the mesh sleeve 3 from being broken, so that there is provided an air pressure actuator having durability against repetitive operation or, in other words, having a long life. As described in the specification, the provision of a seam causes failure and reduced life. Applicants submit that the aforementioned features are now set forth in the independent and dependent claims of this application and are not disclosed or taught in the cited, as will become clear from the following discussion.

The rejection of claims 1 - 4 under 35 USC 102(b) as being anticipated by Takagi et al (4615260); the rejection of claim 4 under 35 USC 103(a) as being

unpatentable over Takagi et al (4615260); the rejection of claims 7 and 8 under 35 USC 103(a) as being unpatentable over Takagi et al (4615260) in view of Paynter (4715869); the rejection of claims 9 - 14 under 35 USC 103(a) as being unpatentable over Johnson et al (5662693) in view Takagi et al (4615260); the rejection of claims 15 and 17 under 35 USC 103(a) as being unpatentable over Johnson et al (5662693) in view of Takagi et al (4615260) and further in view of Culhane et al (WO0168028); and the rejection of claims 16 and 17 under 35 USC 103(a) as being unpatentable over Johnson et al (5662693) in view of Takagi et al (4615260) and further in view of Kawada et al (JP07204233); such rejections are traversed insofar as they are applicable to the claims, as amended, and newly added claims, and reconsideration and withdrawal of the rejections are respectfully requested.

As to the requirements to support a rejection under 35 USC 102, reference is made to the decision of In re Robertson, 49 USPQ 2d 1949 (Fed. Cir. 1999), wherein the court pointed out that anticipation under 35 U.S.C. §102 requires that each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference. As noted by the court, if the prior art reference does not expressly set forth a particular element of the claim, that reference still may anticipate if the element is "inherent" in its disclosure. To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." Moreover, the court pointed out that inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.

At the outset, applicants note that Takagi et al is utilized as a primary or secondary reference in each of the rejections as set forth by the Examiner, whether under 35 USC 102 or 35 USC 103, and that while the Examiner did not consider the features of claims 5 and 6 in relation to claim 1, the features of claim 5 were also present in claim 11 which depended from claim 9 and the features of claim 11 have apparently been considered. The Examiner contends that Takagi et al discloses a fluid pressure actuator having an inner tube (1), a mesh sleeve (2), and a low friction member (33). More particularly, at page 5 of the office action, the Examiner contends that Takagi et al discloses:

... a low friction member (33) obtained by so knitting fine fibers as to possess expanding and contracting properties between the inner tube and the mesh sleeve, the low friction member being so arranged as to cover the inner tube. Wherein the low friction member is obtained by knitting, in a circumferential direction without seam, a synthetic fiber of a combination of a polyurethane core fiber and a nylon fiber so as to exhibit expanding/contracting property. (emphasis added).

Irrespective of the contentions by the Examiner, applicants submit that Takagi et al discloses protective layer 33, as described in column 7, line 58 to column 8, line 21, as not providing any resistance to the expansion of the tubular body 1, and being made of fine fiber filaments braided so as to be expansible and contractible as in a tricot weave, as illustrated in Fig. 10. Applicants submit that there is no disclosure or teaching in Takagi et al that the protective layer 33, as described in Takagi et al, is a low friction member and being a cylindrical body obtained by knitting fine fibers in a circumferential direction without a seam. Thus, irrespective of the Examiner's contention, applicants submit that the features of independent claims 1 and 9, as amended, patentably distinguish over Takagi et al in the sense of 35 USC 102 and 35 USC 103.

Applicants further note that claim 2 which depends from claim 1, and newly added claim 21 which depends from claim 9, recite the feature that the low friction member has a coefficient of friction for the mesh sleeve which is smaller than a coefficient of friction thereof for the inner tube. Hereagain, such features are not disclosed or taught by Takagi et al in the sense of 35 USC 102 or 35 USC 103. Additionally, claim 3 which depends from claim 1 and claim 10 which depends from claim 9 recites the feature that the low friction member is obtained by knitting a synthetic fiber of a combination of a polyurethane core fiber and a nylon fiber so as to exhibit expanding/contracting property. While the Examiner attributes such features to the protective layer 33, applicants submit that Takagi et al only discloses in column 8, lines 14 to 18 that the material for the protective layer 33 is an elastic material which has high resistance to injury or damage and does not obstruct the expansion and contraction as much as possible, for example, a high molecular plastic material such as urethane or the like. Thus, applicants submit that Takagi et al fails to provide a disclosure or teaching in the sense of 35 USC 102 or 35 USC 103 of the aforementioned features. Applicants note that the other dependent claims recite additional features which are not disclosed or taught by Takagi et al. For example, the Examiner recognizes that with respect to the features of claim 4, Takagi et al does not explicitly teach that the synthetic fiber has a thickness of about 40 deniers. Rather, the Examiner contends that since applicant has not disclosed that the 40 deniers solves any stated problem, it would be obvious to utilize the same in Takagi et al. Applicants submit that the disclosure of this application clearly sets forth improved operation with respect to the recited features including longer life (see pages 14 and 15 of the specification) and there is no disclosure or teaching in Takagi et al of the recited features of the independent and dependent claims of this

application. Thus, applicants submit that claims 1 and 9 and the dependent claims patentably distinguish over Takagi et al and should be considered allowable thereof.

With respect to the combination of Takagi et al with the other cited art of Paynter, Johnson et al, Culhane et al and Kawada, irrespective of the disclosures of this other art, applicants submit that the other cited art does not overcome the deficiencies of Takagi et al as pointed out above and the proposed combination fails to provide the structural features as recited in independent claim 1 and independent claim 9, as amended and the dependent claims thereof. Thus, applicants submit claims 1 and 9 and the dependent claims patentably distinguish over the cited art in the sense of 35 USC 102 and 35 USC 103, and all claims should be considered allowable thereover.

With respect to the newly added independent claim 22, this claim recites the fine mesh structure of the mesh sleeve which prevents the inner tube from partly swelling through the fine mesh structure of the mesh sleeve when the inner tube expands, as described in the specification of this application. Applicants submit that Takagi et al describes the braided structure 2 as being formed of a cord comprising a monofilament or steel wire 16 as illustrated in Fig. 7 or comprising a number of fine filaments 35 twisted or non-twisted to form a bundle 37 and a rubber-like elastomer or synthetic resin 38 coated on the bundle as shown in Fig. 8 or a flat yarn 39 as shown in Fig. 9. Applicants submit that Takagi et al does not disclose or teach a mesh sleeve having a fine mesh structure which prevents the inner tube from partly swelling through the fine mesh structure of a mesh sleeve when the inner tube expands and providing the advantages as described in the specification of this application. See, for example, the first full paragraph at page 14 of the specification. More particularly, applicants note that, as described at pages 13 and 14 of the

specification, a mesh sleeve having 288 polyethylene filaments exhibited no change in size of the mesh over the whole mesh sleeve and the lengthwise direction thereof and exhibited uniform expansion and contraction even after being used repetitively. Applicants submit that such features, as recited in claim 22 and the dependent claims as well as dependent claims 18 - 20, are not disclosed or taught in Takagi et al taken alone or when considered with the other cited art. Thus, applicants submit that the newly added claims also recite features not disclosed or taught in the cited art and should be considered allowable at this time.


Applicants are also submitting herewith an Information Disclosure Statement and consideration of the documents is requested.

In view of the above amendments and remarks, applicants submit that all claims present in this application should now be in condition for allowance and issuance of an action of a favorable nature is courteously solicited.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 529.45376X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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